

## 1500 JENKINS

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#### CLAIM & DETAILED DESCRIPTION

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(Claim 1) A high frequency oscillator and two or more amplifiers which amplify independently the high frequency electric power from a high frequency oscillator, respectively. High frequency plasma application equipment equipped with the single electrode with which it is arranged in the vacuum chamber in which plasma is formed, and two or more amplified high frequency electric power is supplied, and the means for arranging the phase of two or more high frequency electric power supplied to a single electrode.

## Detailed Description of the Invention

## 100417

(Industrial Application) This invention relates to high frequency plasma application equipment adapting high frequency plasma, such as etching and CVD (chemical vapor Deposition) equipment.

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(Description of the Prior Art) With high frequency plasma application equipment adopting high frequency plasma, such as etching and CVD equipment, high frequency electric power is supplied to the electrode arranged in a vacuum. Enlargement of the electrode with which high frequency electric power is supplied in these processes has been progressing recently.

Drawing 1 shows the conventional example of such high frequency application equipment, and 1 is a high frequency oscillator. The high frequency electric power from the high frequency oscillator 1 is introduced to the electrode 2 in the electric discharge chamber 4. After 2 is amplified by the high frequency amplifier 3 and impedance matching is performed by the matching coil 3. In addition, the inside 1 of a tube expresses the inductance of wiring from the outlet of a magnetic box 3 to an electrode 2.

[0003] With the above-mentioned composition, the high frequency electric power from the high frequency oscillator 1 is impressed to the electrode 5 in a chamber 4, after it is amplified with the high frequency amplifier 2 and impedance matching is performed by the matching box 3. If it is as a result, for example, on etch apparatus, plasma will be formed between an electrode 5 and the etching material which is not illustrated, and, as for etching material, etching processing will be performed by plasma.

[0004] [Problem to be solved by the invention] As described above, area of the electrode 5 is enlarged these days, but with equipment, it has conventionally the structure where electric power is supplied to high frequency electric power at one place of an electrode 5 from the high frequency oscillator 1 to such a big electrode 5. Therefore, it has the fault to watch the voltage difference between the electric supply part of high frequency electric power and the end of an electrode 5 becomes large, and the density distribution of the plasma formed in chamber 4 inside worsens as a result. As a result, if it is etching, etching unevenness will occur.

[0005] Moreover, in order to lessen the voltage difference between the electric supply part of an electrode 5, and an end, using a big high frequency power supply is also considered, but compared with the high frequency power supply of the output of several kilowatt order already used in this case, a price becomes remarkably high and becomes difficult [the handling]. Since it will become a custom-made item instead of standard goods if a power supply becomes large in addition to it, a price will rise increasingly. Furthermore, although high power high frequency electric power will be introduced into a vacuum through the wall of the electric discharge chamber 4, the technology of the thing for large electric power, i.e., technology, such as electric strength and an economic measure, cannot exclude the introductory barrier T to this chamber 4, and a high power high frequency power supply cannot be used from this field, either.

[0006] This invention was made in view of such a point, and even if a big electrode is used for the purpose, it is to realize the high frequency plasma application equipment which can make intensity distribution of plasma uniform with easy composition.

[0007] [Means for solving problem] Two or more amplifiers with which the high frequency plasma application equipment based on this invention amplifies independently the high frequency electric power from a high frequency oscillator and a high frequency oscillator, respectively, it is arranged in the vacuum chamber in which plasma is formed, and is characterized by having the single electrode with which two or more amplified high frequency electric power is supplied and a means for arranging the phase of two or more high frequency electric power supplied to a single electrode.

[0008]

